WHAT IS CLAIMED IS:

1. An optical recording medium comprising:

a substrate including a substrate material having a refractive index and a plurality of nanoparticles of a material having a refractive index greater than that of the substrate material and being included in the substrate material at such a density that the refractive index of the substrate is greater than that of the substrate material without decreasing the transparency of the substrate;

a recording layer; and

a protective layer.

2 An optical recording medium according to claim 1, wherein the material that forms the nanoparticles is at least one of an oxide, a nitride, a carbide, a sulfide, a selenide, a metallic element, and a non-metallic element.

3. An optical recording medium according to claim 1, wherein the material that forms the nanoparticles is at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), an alloy comprising Zn, Se, S, and Te (Tellurium).

4. An optical recording medium according to claim 1, wherein the refractive index of the substrate is greater than 1.55.

5. An optical recording medium according to claim 1, wherein the substrate material comprises one of plastic, epoxy, polycarbonate, polymethylmethacrylate (PMMA), and glass.

6. An optical recording medium according to claim 1, wherein the nanoparticles have a diameter of less than 1,000 nm.

7. An optical recording medium according to claim 1, wherein the nanoparticles have a diameter of less than 500 nm.

8. An optical recording medium according to claim 1, wherein the nanoparticles have a diameter of less than 100 nm.

9. An optical recording medium according to claim 1, wherein the nanoparticles have a diameter of less than 50 nm.

10. An optical recording medium according to claim 1, wherein the nanoparticles have a diameter of less than 20 nm.

11. An optical recording medium according to claim 1, wherein a wt% of the nanoparticles in the substrate is less than 50 wt%.

12. An optical recording medium according to claim 1, wherein laser light incident upon the substrate is focused to a spot size of less than about 1.7 μm.

13. An optical recording medium according to claim 1 further comprising a second substrate including a second substrate material having a refractive index and a second recording layer.

14. An optical recording medium according to claim 13 wherein the second substrate further comprises a plurality of nanoparticles of a material having a refractive index greater than that of the second substrate material and being included in the second substrate material at such a density that the refractive index of the second substrate is greater than that of the second substrate material without decreasing the transparency of the second substrate.

15. An optical recording medium according to claim 13, wherein the index of refraction of the substrate is different than the refractive index of the second substrate.

16. An optical recording medium comprising:

a substrate including a substrate material having a refractive index and a plurality of nanoparticles of a material having a refractive index greater than that of the substrate material and being included in the substrate material at such a density

that the refractive index of the substrate is greater than that of the substrate material without decreasing the transparency of the substrate;

a recording layer having encoded information; and

a protective layer.

17. An optical recording medium according to claim 16 wherein the encoded information is stored as a series of pits.

18. An optical recording medium according to claim 17, wherein the material that forms the nanoparticles is at least one of an oxide, a nitride, a carbide, a sulfide, a selenide, a metallic element, and a non-metallic element.

19. An optical recording medium according to claim 17, wherein the material that forms the nanoparticles is at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), an alloy comprising Zn, Se, S, and Te (Tellurium).

20. An optical recording medium comprising:

a substrate;

a recording layer; and

a protective layer including a protective material having a scratch resistance and a plurality of nanoparticles of a material having a scratch resistance greater than that of the protective material and being included in the protective material at such a density that the scratch resistance of the protective layer is greater than that of the protective material.

21 An optical recording medium according to claim 20, wherein the material that forms the nanoparticles is at least on of an oxide, a nitride, a sulfide, and a selenide.

22. An optical recording medium according to claim 20, wherein the material that forms the nanoparticles is at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), silica, CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), and an alloy comprising Zn, Se, S, Te (Tellurium).

23. An optical recording medium according to claim 20, wherein a wt% of the nanoparticles in the protective layer is less than 70 wt%.

24. An optical recording medium according to claim 20 wherein the recording layer includes encoded information.

25. An optical recording medium according to claim 24 wherein the encoded information is stored as a series of pits.

26. An ocular device with a scratch resistant surface comprising:

a matrix material having a surface;

nanoparticles dispersed within the matrix material to provide scratch resistance to the surface of the matrix material.

27. The ocular device according to claim 26, wherein the material that forms the nanoparticles is at least one of an oxide, a nitride, a sulfide, a carbide, and a selenide.

28. The ocular device according to claim 26, wherein the material that forms the nanoparticles is at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), and an alloy comprising Zn, Se, S, and Te (Tellurium).

29. The ocular device according to claim 26, wherein the matrix material is at least one of a plastic and a glass.

30. The ocular device according to claim 26, wherein the matrix material is at least one of a polycarbonate, a polyolefin, a polyurethane, and CR 39.

31. A method of storing data comprising:

providing an optical storage medium comprising a substrate, a recording layer, and a protective layer; and

using a light source to record information onto the recording layer,

wherein the substrate comprises a substrate material having a refractive index and a plurality of nanoparticles having a refractive index greater than that of the substrate material and being included in the substrate material at such a density that the refractive index of the substrate is greater than that of the substrate material without decreasing the transparency of the substrate.

32. A method of claim 31, wherein the information comprises audio data.

33. A method of claim 31, wherein the information comprises text data.

34. A method of claim 31, wherein the information comprises audio data and video data.

35. The method of claim 32, wherein the light source is selected from a laser and a LED.

36. A coating for an ocular device comprising:

a matrix material; and

nanoparticles dispersed within the matrix material to provide scratch resistance to the surface of the matrix material.

37. The coating of claim 36, wherein the matrix material is at least one of a material forming a scratch resistant coating, a UV coating, a mirror coating, and an anti-reflection coating.

38. The coating of claim 36, wherein the nanoparticles comprise at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), and an alloy comprising Zn, Se, S, and Te (Tellurium).

39. A method for coating an ocular device comprising:

providing a matrix material;

dispersing nanoparticles within the matrix material; and

applying the matrix material with the dispersed nanoparticles therein on a surface of the ocular device.

40. A method of claim 39, wherein the nanoparticles comprise at least one of an oxide, a nitride, a sulfide, a carbide, and a selenide.

41. A method of claim 39, wherein the nanoparticles comprise at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), and an alloy comprising Zn, Se, S, and Te (Tellurium).

42. A method of claim 39, wherein the matrix material and the dispersed nanoparticles form at least one of a scratch resistant coating, a UV coating, a mirror coating, and an anti-reflection coating.

43. An ocular device comprising:

a first matrix material; and

a coating comprising a second matrix material and a plurality of nanoparticles.

44. An ocular device of claim 43, wherein the first matrix material is at least one of a plastic and a glass.

45 The ocular device of claim 43, wherein the first matrix material is at least one a polycarbonate, a polyolefin, a polyurethane, and CR 39.

46. The ocular device of claim 43, wherein the second matrix material forms at least on of a scratch resistant coating, a UV coating, a mirror coating, and an anti-reflection coating

47. The ocular device of claim 43, wherein the nanoparticles comprise at least one of an oxide, a nitride, a sulfide, a carbide, and a selenide.

48. The ocular device of claim 43, wherein the nanoparticles comprise at least one of titanium dioxide (TiO_2), magnesium oxide (MgO), yttria (YtO), zirconia (ZrO_2), silicon oxide (SiO_x), CeO_x, alumina (Al_2O_3), lead oxide (PbO_x), carbon nanotubes, a composite of yttria and zirconia, gallium nitride (GaN), silicon nitride, aluminum nitride, zinc selenide (ZnSe), zinc sulfide (ZnS), and an alloy comprising Zn, Se, S, and Te (Tellurium).

49. The ocular device of claim 43, wherein the nanoparticles are coated to prevent agglomeration.